PROC. BIOL. SOC. WASH.
92(4), 1979, pp. 762–768

A REDESCRIPTION OF *SCOLOPLOS SIMPLEX* (HUTCHINGS, 1974) (POLYCHAETA: ORBINIIDAE) FROM AUSTRALIA

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Abstract.—The orbiniid polychaete *Scoloplos simplex* (Hutchings, 1974) from Australia is redescribed and compared to *Scoloplos fragilis* (Verrill, 1873) from the east coast of North America. The genera *Scoloplos* Blainville, *Haploscoloplos* Monro and *Leitoscoloplos* Day are discussed.

In connection with a study on the distribution of *Scoloplos fragilis* (Verrill, 1873) in the intertidal zone of a geologically-active tidal flat in Delaware Bay (Brown, 1979), I reviewed the literature on the biology, reproduction and geographic distribution of the species. In her study on the polychaetes of the New England region, Pettibone (1963:292) reported that *S. fragilis* was known from the Gulf of St. Lawrence and Newfoundland to Florida and the Gulf of Mexico, in low water to 102 meters. Anderson (1960:105) identified some specimens from the sand flats of Botany Bay, New South Wales as *Haploscoloplos fragilis* (see discussion of *Scoloplos, Haploscoloplos,* and *Leitoscoloplos* below). In the following year, Anderson (1961:257) reported on the embryonic and postembryonic development of this Australian species from Botany Bay. These records of *H. fragilis* from New South Wales were not mentioned by Pettibone (1963) since they appeared while her paper was in press (Pettibone, in correspondence). Reference to the development of *H. fragilis* by Anderson was cited by Schroeder and Hermans (1975:130) in their recent review of polychaete reproduction. Using the latter publication, Holland and Polgar (1976:346) summarized the reproductive mechanism of *H. fragilis* (Holland, personal communication). To my knowledge, the development of *S. fragilis* from the east coast of North America has yet to be described. It should be noted here that the two references of Anderson (1960, 1961) were not mentioned by Hutchings (1974:183) when she described a new species of *Haploscoloplos* from New South Wales or by Day (1977:217) in his review of the Australian and New Zealand Orbiniidae.

Thus it was of interest to examine some of Anderson's specimens from Botany Bay and compare them with my specimens of *S. fragilis* from Delaware Bay. Anderson (1960:105) mentioned that his specimens differed from the description of *H. fragilis* by Hartman "only in the absence of an interramal cirrus on the anterior abdominal parapodia, a character very variable

within the family." In correspondence with Dr. Pettibone, it was learned that Dr. Anderson's collection of *H. fragilis* from Botany Bay was not available in the United States National Museum of Natural History or in the Australian Museum (information from Dr. P. Hutchings). Dr. Anderson rectified the situation by very kindly collecting some additional specimens from the site in Botany Bay where he had made his previous collections and carried out his developmental studies. Seventeen specimens (USNM 54834) were sent to Dr. Pettibone and then forwarded to me on loan for study. They proved to belong not to *S. fragilis* (Verrill) but to *Haploscoloplos simplex* Hutchings (1974:183), described from Wallis Lake, New South Wales and referred to *Scoloplos* (*Scoloplos*) *simplex* (Hutchings) by Day (1977:228), who added additional records from Australia: Queensland, New South Wales, Victoria and Western Australia. A paratype of *H. simplex* (USNM 49487) was also available for study. The specimens of *S. simplex* from New South Wales are described below and compared with *S. fragilis* from the east coast of North America, followed by a discussion of *Scoloplos* Blainville, *Haploscoloplos* Monro, and *Leitoscoloplos* Day.

FAMILY ORBINIIDAE (=ARICIIDAE)

Scoloplos Blainville

Scoloplos simplex (Hutchings)

Haploscoloplos fragilis.—Anderson, 1960:105–106; 1961:257–272, figs. 1, 2.—Schroeder and Hermans, 1975:130 (data from Anderson, 1961). Not Verrill, 1873.

Haploscoloplos simplex.—Hutchings, 1974:183–184, fig. 2A–D.

Scoloplos (*Scoloplos*) *simplex*.—Day, 1977:228–229.

Material examined.—New South Wales, Australia: Botany Bay, January 1977, D. T. Anderson, coll.—17 specimens (USNM 54834). Wallis Lake, sta. 401–450, sandy, December 1970, Univ. of N.S.W., coll.—paratype of *Haploscoloplos simplex* (USNM 49487).

Description.—The prostomium is conical, longer than wide when complete (Fig. 1a). Deep slits, one located anteriolaterally on each side of the achaetous, single-ringed peristomium, form the nuchal organs. No eyespots are visible. The proboscis is eversible and foliose (Hutchings, 1974, Fig. 2A). The width, measured at the junction between the thorax and abdomen, ranges from 1.4 to 2.6 mm. Branchiae appear first as small papillae on setigers 9–12 (Table 1). This character does not depend on the size of the organism. In most cases, branchiae become fully developed on the first abdominal setiger. Occasionally, the transition between the thorax and abdomen occurs over three setigers with the intermediate setiger having branchiae intermediate between the papillate and well-developed forms. The transition between thorax and abdomen occurs more posteriorly in larger

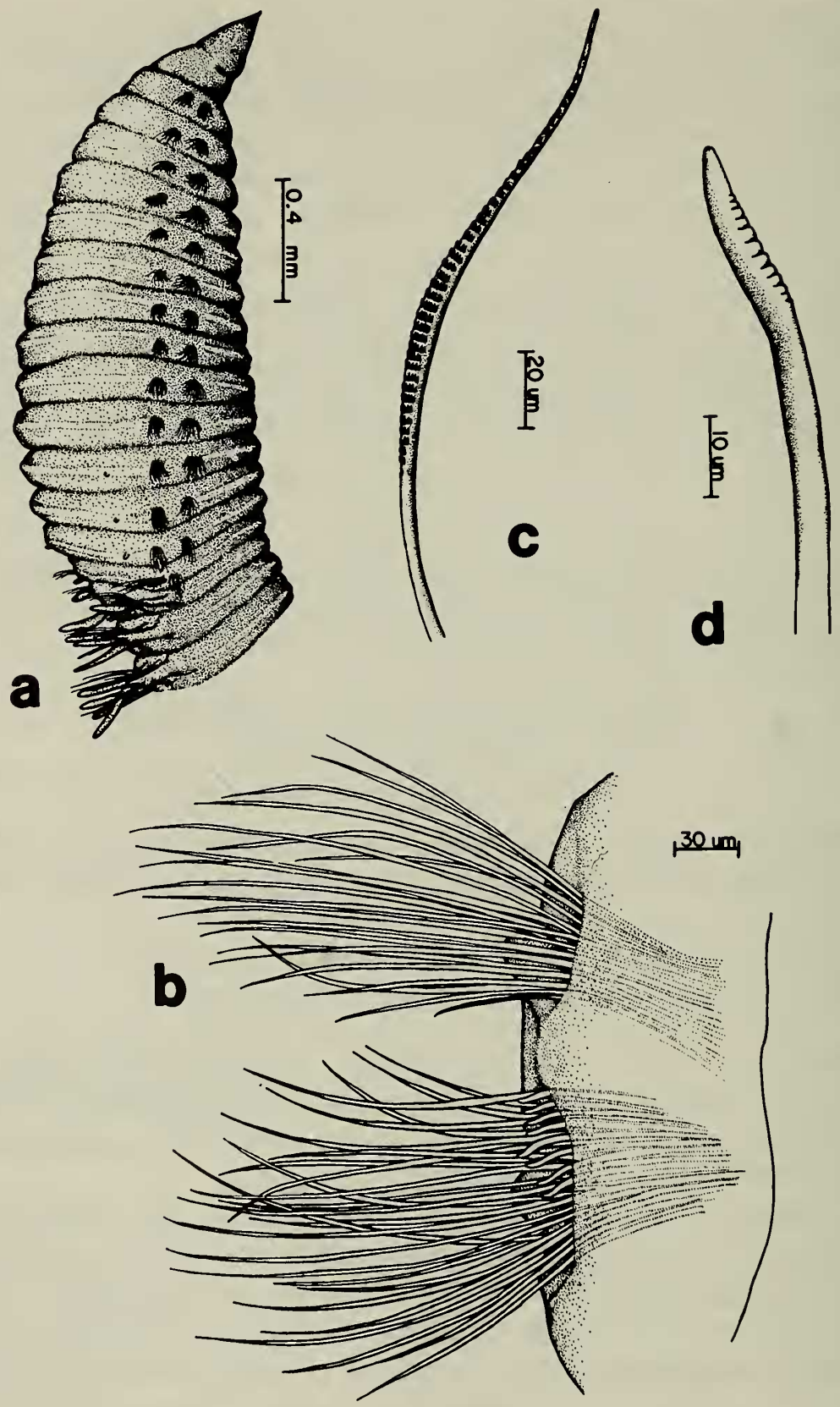

Fig. 1. *Scoloplos simplex*: **a**, Anterior end, lateral view; **b**, Parapodia of 4th setiger, anterior view; **c**, Crenulate capillary setae; **d**, Thoracic, neuropodial hook.

Table 1.—Morphological and sexual variability among specimens of *Scoloplos simplex* (Hutchings).

Specimen number	Width* (mm)	Setiger** branchial papillae begin	Setiger # of transition between thorax and abdomen	Sex
1	1.4	9	14–15	Male
2	1.4	11, 13	14–15	Male
3	1.6	10, 11	15–16	?
4	1.6	11	14–15	Male
5	1.7	9	14–16	Male
6	1.7	10	14–15	Male
7	1.8	11	14–16	Male
8	1.8	11, 12	14–15	?
9	2.0	12	14–16	Female
10	2.0	12	14–15	Female
11	2.2	10	14–15	Female
12	2.3	9, 10	15–16	Female
13 (paratype)	2.3	9, 10	16–17	Female
14	2.4	11	16–17	Male
15	2.5	12	16–17	Female
16	2.6	9, 10	16–17	?
17	2.6	10	16–17	Female
18	2.6	10	16–17	Male

* Measured at the junction between the thorax and abdomen.

** The branchial papillae often begin on different setigers on opposite sides of the same specimen. Numbers indicate the setiger on which the papillae begin on the opposite sides of the specimen. The anterior-most papilla is listed first.

specimens (Table 1) and appearance of the first abdominal setiger ranges from setiger 15 to setiger 17 (up to setiger 18, according to Hutchings). Thoracic notopodia and neuropodia have simple, papillate postsetal lobes (Fig. 1b), which become increasingly cirriform towards the posterior end of the thorax. Thoracic notosetae are all crenulate capillaries (Fig. 1c). Two types of thoracic neurosetae are found: 1) crenulate capillaries (Figs. 1b, c) and 2) short hooks, 6–8 per neuropodia, with slightly bent tips and present on all but the last one or two setigers of the thorax (Fig. 1d). Abdominal setae are all crenulate capillaries. In the abdomen, the cirriform, postsetal notopodial lobes are equally as long as the notosetae and branchiae. The branchiae and abdominal notopodia emerge dorsally. The abdominal neuropodia emerge dorsolaterally and are bilobed, with inner lobes longer than outer lobes. The outer lobe is incised just below its tip (Fig. 1a), below which the ventrolateral margins may have a whitened, glandular appearance. Anal cirri are absent. In most cases, sex could be determined, with females appearing to be larger than males (Table 1). Preserved specimens are white or buff colored.

Distribution.—Along coast of Queensland, New South Wales, Victoria and Western Australia.

Remarks.—The above description differs slightly from that of Hutchings (1974). Hutchings noted, "Faded eyespots are arranged in two oval patches at the base of the prostomium." The nuchal organs, described above, are situated in oval patches at the base of the prostomium and are probably equivalent to Hutchings' eyespots. Two types of thoracic neurosetae were noted by Hutchings: "(1) long distally pointed spinous setae, which when viewed side on have a toothed appearance, and (2) 10–15 simple acicular type setae with a slightly bent tip. The bases of these setae appear to be split, and they are slightly more chitinized than the spinous setae." The neuropodial, crenulate capillaries observed in this study are synonymous with Hutchings' type 1 "spinous setae." The hooks seen in this study, probably equivalent to Hutchings' type 2 "acicular type setae," were fewer in number (6–8 per bundle) than those observed by Hutchings (10–15 per bundle), indicating considerable variation in this character. The bases of the hooks observed in this study did not appear to be split.

Scoloplos simplex (Hutchings) from Australia differs from *Scoloplos fragilis* (Verrill) from the east coast of North America in the following ways:

	S. simplex	*S. fragilis*
Thoracic neurosetae	Short hooks and long capillaries	Long capillaries only
Interramal cirri on anterior abdominal segments	Absent	Present
Anal cirri	Absent	Present
Subpodal papillae at junction of thorax and abdomen	Absent	Present

Discussion of *Scoloplos* Blainville, *Haploscoloplos* Monro and *Leitoscoloplos* Day: *Scoloplos* Blainville (1828:493), with type-species *Lumbricus armiger* O. F. Müller by monotypy, is characterized by a pointed prostomium and a one-ringed, achaetous buccal segment or peristomium, the thoracic neuropodia have unfimbriated, postsetal lobes with 0–3 papillae, sometimes with subpodal or ventral papillae on some segments; the thoracic neurosetae include crenulate capillaries and sometimes blunt hooks. Monro (1933:261) established the genus *Haploscoloplos,* with type-species *Scoloplos cylindrifer* Ehlers (1905) by original designation, with the diagnosis: "As *Scoloplos* but with crenate capillary bristles only." Hartman (1944:340, 1957:269) retained the distinction between the two genera, while Pettibone (1957:160) synonymized them stating, "In some cases this character is difficult to observe; the crotchets may be easily missed, occurring in some thoracic neuropodia and not in others. Until it can be established how much the abrasive action of certain substrate has to do with the formation of

certain types of crotchets from capillaries, the character does not seem a good one."

Curtis (1969:3280) presented evidence from benthic samples that suggested hooks appeared in *Scoloplos armiger* as it matured and were lacking in juveniles. I gathered similar data on *S. armiger* from George's Bank off Massachusetts. In agreement with Pettibone, Curtis was of the opinion that the absence of hooks is not a sufficient criterion for generic distinction. In a review of the subfamily Orbiniinae, Day (1973:86) stated, "To me there seems no possibility that the normal hooks with rounded ends and guards could have been formed from broken or abraded crenulate capillaries. While I recognize that juvenile specimens of some species of *Scoloplos* may be wrongly assigned to *Haploscoloplos,* I agree with Hartman and Monro in recognizing it as a valid genus." Both genera have continued to be used to describe species without hooks in the thoracic neuropodia.

In connection with a review of the Australian and New Zealand Orbiniidae, Day (1977:218) examined a specimen of *Scoloplos cylindrifer* Ehlers, the type-species of *Haploscoloplos* as selected by Monro, and found on examination of the thoracic neurosetae "an anterior row of short, slender hooks that is easily overlooked. Thus the type species of *Haploscoloplos* is a synonym of *Scoloplos.*" For the species that did fit the definition of *Haploscoloplos,* Day (1977:218) erected a new genus *Leitoscoloplos.* The small thoracic neuropodial hooks in *Scoloplos cylindrifer* had previously been overlooked by Ehlers (1905:45), Monro (1939:124), and many others. The short rows of thoracic neuropodial hooks in the orbiniids from New South Wales, identified as *Haploscoloplos fragilis* by Anderson (1960, 1961), were also overlooked.

In order to designate a new genus, the separating character should be readily detectable and clear cut in its segregation of the group possessing it (Blackwelder, 1967:203; Mayr, 1969:92). Use of any single character is less likely to give satisfactory results in natural classification than if the character correlates with other characters descriptive of the group (Blackwelder, 1967:203). The use of the presence or absence of hooks to separate *Leitoscoloplos* or *Haploscoloplos* from *Scoloplos* is not a readily detectable character. Accordingly, the synonymy of *Leitoscoloplos* and *Haploscoloplos* with *Scoloplos* has been retained here.

Acknowledgments

I am grateful to Dr. Anderson for collecting and contributing specimens from Australia. Robert Palmer and Robert Prezant provided useful criticism of the manuscript during preparation. I am especially grateful to Dr. Marian H. Pettibone of the Smithsonian Institution for the loan of specimens and for critically reviewing the manuscript. This is contribution 147, University of Delaware, College of Marine Studies.

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